
RAC V

RESPONSE ACTION CONTRACT FOR

Remedial, Enforcement Oversight, and
Non-Time Critical Removal Activities at Sites of Release
or Threatened Release of Hazardous Substances in Region V

PREPARED FOR

U.S. Environmental Protection Agency



PREPARED BY

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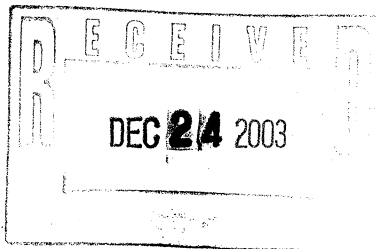
Tucker, Young, Jackson, Tull, Inc.

**MARKLAND AVENUE QUARRY (OU4)
BASIS OF DESIGN
CONTINENTAL STEEL SUPERFUND SITE
Kokomo, Indiana**

**Markland Avenue Quarry
Backfill and Final Cover
Remedial Design**

WA No. 122-RDRD-05BW/Contract No. 68-W6-0025

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Abbreviations and Acronyms

ARAR	Applicable or Relevant and Appropriate Requirements
BOD	Basis of Design
CAA	Clean Air Act
CAMU	Corrective Action Management Unit
CCI	CH2M HILL Constructors, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CQAP	Construction Quality Assurance Plan
CSSS	Continental Steel Superfund Site
CWA	Clean Water Act
DNAPL	dense non-aqueous phase liquid
ft	feet
gpm	gallon per minute
HMTA	Hazardous Materials Transportation Act
HSWA	Hazardous and Solid Waste Act Amendments of 1984
IAC	Indiana Administrative Code
IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources
in.	inches
LDR	Land Disposal Restriction
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NCP	National Contingency Plan
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
O&M	operations and maintenance
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PAH	polyaromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	perchloroethene
PID	photoionization device
PVC	polyvinyl chloride

RCRA	Resource Conservation and Recovery Act of 1976
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SDWA	Safe Drinking Water Act
SMP	site management plan
SOW	Statement of Work
TCE	trichloroethene
TSCA	Toxic Substances Control Act
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UTS	Universal Treatment Standard
UV	ultraviolet light
VOC	volatile organic compound
WWTP	wastewater treatment plant
yd ³	cubic yards

Introduction

CH2M HILL prepared this Basis of Design (BOD) Report for the Continental Steel Superfund Site (CSSS) Markland Avenue Quarry (OU4) final cover for the United States Environmental Protection Agency (USEPA) under Contract No. 68-W6-0025 in accordance with the Statement of Work (SOW) in the Record of Decision¹ (ROD) issued in September 1998 and the Remedial Design/Remedial Action (RD/RA) Handbook issued in June 1995.² This BOD Report is divided into the following sections:

- Introduction
- Project Delivery Strategy
- Design Approach, Assumptions, and Parameters
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)
- Construction Schedule
- Cost Estimate
- Biddability, Constructibility, and Operability Review
- Tables
- Figures
- Appendixes

The appendixes included with this BOD report provide supplemental information integral to the design of the selected remedy. They consist of:

- Appendix A: Markland Avenue Quarry Remedial Investigation Figures – The figures from the RI are included as a reference to show areas that will be excavated and covered with geotextile fabric and 1 foot of soil cover instead of 2 feet of soil cover.
- Appendix B: Stormwater Calculations – Presents a technical discussion and supporting calculations regarding the stormwater management features of the quarry cover.
- Appendix C: M-CACES Cost Estimate – A cost estimate within an accuracy of +15 to -5 percent in M-CACES format.

The design specifications and drawings that accompany this report have been included as separate submittals. A Construction Quality Assurance Plan (CQAP) and a Draft Operation and Maintenance (O&M) Manual will be submitted at a later date. The separate design specification and drawing submittal includes all of the drawings cited in this report.

Site History

The Remedial Investigation/Feasibility Study (RI/FS) and ROD contain a detailed description of the history of Continental Steel. Throughout its history, the plant produced

¹ USEPA/IDEM. *Record of Decision: Continental Steel Corporation Superfund Site*. Kokomo, Howard County, Indiana. September 1998.

² USEPA. *Remedial Design/Remedial Action Handbook (EPA 540/R-95/059)*. June 1995.

nails, wire, and wire fence from scrap metal. Operations included reheating, casting, rolling, drawing, pickling, annealing, hot-dip galvanizing, tinning, and oil tempering. The steel manufacturing operations included the use, handling, storage, and disposal of hazardous materials. For purposes of the RI/FS and the RD/RA, the site was divided into six operable units (OUs) that include:

- OU1 – Sitewide Groundwater
- OU2 – Lagoon Area
- OU3 – Wildcat and Kokomo Creeks
- OU4 – Markland Avenue Quarry
- OU5 – Main Plant
- OU6 – Slag Processing Area

Site Description

The CSSS is an uncontrolled hazardous waste site located in Kokomo, Indiana. The Indiana Department of Environmental Management (IDEM) was the lead agency responsible for conducting the RI/FS at the site under a cooperative agreement with USEPA in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), commonly known as "Superfund."

The CSSS is located on West Markland Avenue in the City of Kokomo, Township 23 North, Range 3 East, and Township 24 North, Range 3 East, of Howard County, Indiana (Figure 1). The site encompasses 183 acres and consists of an abandoned steel manufacturing facility (Main Plant), pickle liquor treatment lagoons (Lagoon Area), a former waste disposal area (Markland Avenue Quarry), and a former waste disposal and slag processing area (Slag Processing Area). The site is located within a mixed residential, commercial, and industrial area zoned mainly for general use. Residential properties lie predominantly east and southeast of the site, mixed residential and industrial areas lie to the north and west, and industrial properties are located to the south. The residences closest to the plant are within 100 feet (ft) east of the site, near the property fence line along South Leeds Street, and south of the Main Plant across Kokomo Creek. Highland Park, a public recreation area for local residents, lies south of the Main Plant just across Kokomo Creek immediately adjacent to the CSSS property south of Kokomo Creek.

The 23-acre Markland Avenue Quarry was formerly a limestone quarry, covering nearly the entire property. It is bordered by Harrison Street to the north, West Markland Avenue to the south, Courtland Avenue to the east, and Brandon Street to the west (Figure 2). Review of historical aerial photographs (August 1938 state archive aerial photos) show the original quarry as a large pond spanning the entire block, except for the unexcavated southwestern corner and southern border, between Courtland and Brandon Streets. The quarry was subsequently backfilled about three-quarters full with waste material from site operations. It is estimated that more than 1.28 million cubic yards (yd³) of material were deposited in the quarry.

The quarry, which currently includes a pond (4 acres), varied in depth from 70 to 90 ft. Continental Steel disposed of waste materials such as drums, slag, refractory brick, pig iron, baghouse wastes, and tanks of oil and solvents at the quarry. According to former employees,

the quarry served as a drum reclamation area where drums were dumped directly onto the ground and disposed of in the quarry pond. Sediment in the pond contains high concentrations of volatile organic compounds (VOCs) and dense non-aqueous phase liquid (DNAPL). The sediments, 1 to 3 ft thick, are located below 50 ft of water. The surface water exhibits pH levels up to 12. The quarry is in a residential area, is a nuisance attracting trespassers, and has no current ecological significance.

Selected Remedy—Markland Avenue Quarry (OU4)

Record of Decision

The purpose of USEPA's ROD³ was to select the final RA for the CSSS. The final remedy will control the sources of contamination and prevent the further migration of contaminants. The selected remedy for the Markland Avenue Quarry is to:

- Cover contaminated quarry fill solids with common soil
- Excavate contaminated sediment from the quarry pond
- Dispose of quarry sediment in the Lagoon Area Corrective Action Management Unit (CAMU)
- Backfill the quarry pond with alternative fill material
- Implement deed restrictions

Description of the Record of Decision-Selected Remedial Action

According to the ROD, the RA will include deed and groundwater use restrictions to restrict site access and the use of contaminated groundwater; however, groundwater will be addressed under a separate RD. The RA will also include removing the contaminated sediment from the quarry pond, backfilling it with clean fill, and installing a common soil cover to eliminate potential exposure to and direct contact with contaminated solids. The removal and handling of the quarry pond sediments are addressed under a separate RD. This RD addresses the disposal of the pond sediment and subsequent backfilling and cover activities for the quarry.

The dewatered sediment will be solidified/stabilized as necessary, and moved to the CAMU for disposal. If treatment for VOCs is necessary prior to disposal, the treatment will be conducted at the quarry. The pond will be backfilled with appropriate material, covered, and use restrictions will be implemented to protect the cover.

The 1.28 million yd³ of existing fill material previously placed within the quarry area when Continental Steel was in operation will remain in place. This material will be enclosed by a two-part cover system consisting of either a warning layer barrier and 2 ft of imported general fill or geotextile fabric and 1 ft of imported general fill. The option of using geotextile fabric and 1 ft of imported general fill will be implemented on the eastern property boundary, where it is necessary to meet grade lines on adjacent properties while minimizing excavation onsite. The cover system will provide a warning mechanism in the event of future excavation and it will eliminate direct contact with the contaminated media. The soil cover will be graded and grassed to facilitate drainage, minimize erosion, and provide for recreational use.

³ USEPA/IDEM. *Record of Decision: Continental Steel Corporation Superfund Site*. Kokomo, Howard County, Indiana. September 1998.

CH2M HILL Remedial Design/Remedial Action Implementation Strategy

In 2000, CH2M HILL reviewed the proposed RA activities at the six OUs and formulated an RA strategy that segregates similar types of activities proposed for the various OUs and combines them into manageable contracts⁴ that include:

- Contract 1 – Lagoon Solids Excavation and Consolidation
- Contract 2 – Wildcat and Kokomo Creeks Sediment Removal
- Contract 3 – Markland Avenue Quarry Sediment Excavation
- Contract 4 – Backfill and Capping/Covers
- Contract 5 – Groundwater

Contract 4 for the Markland Avenue Quarry will be implemented as a State-led RA.

Contract 4—Markland Avenue Quarry Final Cover

The final cover RA will be implemented after the dewatered quarry pond sediment has been removed from the site. After the sediment has sufficiently dewatered, it will be tested for VOCs to determine if treatment is required. The predesign investigation results indicate that the amount of DNAPL contained in the sediment is less than anticipated and is not expected to be an issue. If VOC concentrations are an issue, a vapor extraction system will be used to extract and manage the VOC emissions. If no treatment is required, the geotubes would be cut open and the sediment would be moved to the CAMU for disposal.

Once the sediment is removed from the site, the quarry pond will be backfilled 2 ft above the water table with 3-4 inch diameter limestone rock described as "surge rock". After backfilling is completed, the final soil cover will be constructed.

Proposed Remedial Action

Implementation of the Markland Avenue Quarry (OU4) final cover RA is expected to include the following components:

- Site preparation.
- Quarry pond sediment removal.
- Quarry pond backfilling.
- Final cover construction.
- Institutional controls.
- Environmental monitoring and maintenance.
- Five-year site reviews.

Access to some adjoining properties will need to be secured by IDEM to complete the required final grading.

⁴ CH2M HILL. *Technical Assistance Document—RD/RA Implementation Strategy: Continental Steel Corporation Superfund Site*. September 19, 2000.

Project Delivery Strategy

This section presents the project delivery strategy for the Markland Avenue Quarry (OU4) final cover RA. The contracting strategy and primary components of the RA are summarized below. Key project delivery strategies, relative to a specific RA component, are noted below in their respective sections.

Contracting Strategy

The contract documents for the Markland Avenue Quarry (OU4) final cover are being prepared based on the understanding that the State of Indiana (State) is the Owner. CH2M HILL will prepare the specifications and drawings for the State to use as part of their solicitation documents. The State will provide the bidding process instructions and contract terms.

Final Design

Detailed design drawings and specifications are provided for the RA components. The draft CQAP and draft O&M manual will be submitted separately.

The final design package will consist of the following:

- BOD Report, which includes a Cost Estimate, and the Biddability, Operability, and Constructibility Reviews
- Specifications and Drawings
- CQAP
- O&M Manual

Detailed design drawings and specifications have been prepared for the RA components. However, most construction methods and selection of some materials will be based on performance specifications. Performance specifications will allow the contractor(s) flexibility in methods of implementation, while ensuring conformance with the specification requirements.

Remedial Action—Markland Avenue Quarry (OU4)

Descriptions of the primary components of the RA are presented below in their expected construction sequence. The design details and construction methods for each of these components are presented in the following section.

The Markland Avenue Quarry (OU4) final cover RA will be executed by the State using the RD prepared by CH2M HILL. The primary components of the RA, as discussed in the preceding sections, are presented below in their expected construction sequence. Key project delivery strategies, relative to a specific RD component, are noted below in their respective section.

- **Site Preparation**—Clearing and grubbing of vegetated areas will be completed. Perimeter vegetation will be left as long as it is feasible to do so to minimize impacts to adjacent residential areas. Other tasks include trailer setup and utility connections.
- **Quarry Pond Sediment Removal**—Quarry pond sediment previously removed as part of Contract 3 will be remediated, if necessary, and sent to the CAMU for disposal.
- **Quarry Pond Backfilling**—The quarry pond will be backfilled 2 ft above the water table with surge rock, then with approximately 6 ft of imported general fill.
- **Final Cover Construction**—The area within the Markland Avenue Quarry will be covered by either orange safety fencing and a 2 ft-thick layer of imported general fill, or geotextile fabric and 1 ft of imported general fill. The option of using geotextile fabric and 1 ft of imported general fill will be implemented on the eastern property boundary, where it is necessary to meet grade lines on adjacent properties while minimizing excavation onsite.
- **Institutional Controls**—IDEM will establish institutional controls in the form of a restrictive covenant on the property deed for the CSSS site to limit site land and groundwater use. It is not anticipated that activities necessary to secure institutional controls will be performed as part of the RD.
- **Environmental Monitoring/Maintenance**—Environmental monitoring will be performed to determine the remedy's effectiveness. The site O&M Manual will establish the environmental monitoring details. A groundwater monitoring program will be developed later under Contract 5-Groundwater to include evaluation of the effectiveness of the groundwater collection system.
- **Five-Year Site Reviews**—Data collected under the monitoring program will be reviewed at 5-year intervals to determine whether human health and the environment continue to be protected and to determine whether additional RA is warranted. Alternate remedial technologies will be considered if it is determined that remedial objectives are not being achieved.

Design Approach, Assumptions, and Parameters

This section presents the technical details of the Markland Avenue Quarry (OU4) pond sediment removal RA. This section describes the construction methods for each RA component as well as performance standards that must be met during construction. As described previously, the components of the Markland Avenue Quarry (OU4) pond sediment removal RA consist of the following, presented in the expected project delivery sequence:

- Site preparation.
- Quarry pond sediment removal.
- Quarry pond backfilling.
- Final cover construction.
- Institutional controls.
- Environmental monitoring and maintenance.
- Five-year site reviews.

Site Preparation

Areas Requiring Site Preparation

Clearing and grubbing will be performed over the entire site. Perimeter vegetation will be left as long as it is feasible to do so to minimize impacts to adjacent residential areas. Other tasks include installation of silt fencing, trailer setup, and utility connections.

Construction Details Including Design and Construction Technical Factors

Access to some adjoining properties will need to be secured by IDEM to complete the required final grading. A Notice of Intent (NOI) form for construction site activities will be submitted by IDEM prior to the start of construction activities. A site management plan (SMP) will be developed to address construction erosion and sediment control practices. The plan will include instructions for evaluating the effectiveness of implemented erosion control measures and for implementing contingency measures, if required, to address observed erosion effects.

Vegetative matter, including root balls, removed during clearing and grubbing activities will be transported to the CAMU located in the Lagoon Area (OU2) for disposal.

Quarry Pond Sediment Removal

Description of Quarry Pond Sediment Removal

Sediment previously removed as part of Contract 3 and stored in geotubes will be remediated, if necessary, and sent to the CAMU for disposal. The amount of VOCs cannot be accurately estimated prior to sediment removal as it will depend on the amount of oily/tar-like substance encountered.

Construction Details Including Design and Construction Technical Factors

After dewatering for up to 1 year, composite samples from each geotube will be obtained. The composite samples will be tested for VOCs, with additional material obtained for testing of the optimal moisture content and strength of each composite sample. Testing the strength of the samples will be performed at the optimal moisture content, and with the addition of 5-percent cement at moisture levels of 5-, 10-, and 15-percent above the optimum moisture content. The intent of this solidification testing is to determine what range of moisture contents are permissible while achieving an unconfined compressive strength of 30 psi. The contract documents for the quarry cover will then be amended, such that this information would be available during the bidding process as a supplement to Section 02010.

The results from the VOC analysis will be used to determine whether treatment for VOCs is necessary. Treatment will be necessary if the VOC concentrations in the sediment are greater than 10 times the universal treatment standards (UTS).

If VOC concentrations are discovered to be greater than 10 times the UTSs, a soil vapor extraction system (SVE) may be used to treat the VOC-impacted sediment. The objective of the SVE treatment system is to attempt to treat VOC-contaminated sediment to achieve a concentration that is the greater of 90 percent reduction or 10 times the UTS for each of the principal hazardous constituents shown in Table 1. The SVE system may consist of an undetermined number of vertical wells, piping, blower, controls, offgas treatment (if necessary), and a treatment building. A pilot test will be required to collect data to be used in the design of the SVE system for the quarry pond sediment. Data such as radius of influence, air permeability, vacuum/flow rate correlation and offgas concentrations will be required to design the full-scale SVE system.

A pilot test work plan will be developed and submitted to USEPA should the presence of VOCs greater than 10 times the universal treatment standards (UTS) be confirmed. The schedule for the pilot study and report will not be known until the VOC-impacted sediment is tested.

Performance Standards

If necessary, performance standards associated with the SVE treatment operation primarily consist of effective reduction of VOC concentrations in the treated solids. The performance goal for the SVE treatment is a 90 percent reduction in the concentration of all VOCs considered a principal hazardous constituent in the treated soils, or ten times the UTS, whichever resulting concentration is higher. The concentrations corresponding to ten times the UTS for VOCs detected in the quarry pond sediment are shown in Table 1. A short-term performance-monitoring program will be conducted throughout the operation of the SVE treatment system. Components of this monitoring program will include the following:

- Air sampling within and around the SVE treatment boundaries
- Sediment sampling
- Offgas sampling

The performance-monitoring program plan will be included with the O&M plan for the SVE treatment system. This O&M plan will be developed during the design of the SVE treatment system.

Quarry Pond Backfilling

Description of Quarry Pond Backfilling

The quarry pond will be backfilled with surge rock to a level approximately 2 ft above the water surface, then covered with approximately 6 ft of general fill.

Construction Details Including Design and Construction Technical Factors

The quarry pond (approximately 4.5 acres) will be backfilled with 3-4 inch diameter limestone rock referred to as "surge rock." The closest source of this material is the Martin-Marietta Quarry located in Kokomo, IN. The estimated volume of the pond at 2 ft above the water surface is 370,000 yd³. A geotextile fabric will be placed over the surge rock prior to backfilling the remainder of the quarry pond space with imported general fill.

Approximately 45,000 yd³ of general fill will be needed to completely fill in the pond to the surrounding ground surface. The general fill material for the remaining 45,000 yd³ of empty space will be imported from a clean borrow source.

Final Cover Construction

Area Requiring Cover

The entire area within the Markland Avenue Quarry will be covered with a layer of imported soil to eliminate the potential for direct contact with existing site soils. The soil cover will consist of either geotextile fabric covered by 6 inches of imported general fill and 6 inches of topsoil or 18 inches of imported general fill and 6 inches of topsoil, as shown on Drawing No. C-2.

Treatment Details Including Design and Construction Technical Factors

After the pond has been backfilled with surge rock and imported general fill, and the desired elevations for the intermediate grading plan (Drawing No. C-2) have been achieved, the area not backfilled with surge rock and general fill (i.e., the area outside the quarry pond footprint) will be covered with orange safety fence to act as a warning barrier for future excavation activity.

In order to minimize ponding and to promote positive runoff without causing erosion problems on adjacent properties, two small areas of lead contaminated surface soils (Figure 4.4.2-4 of Appendix A) on the east side of the site (Boring Location Nos. 04SS-021 and 04SS-014) will be excavated and graded to promote drainage to the north and east (Drawing No. C-2). Prior to placing the final cover soil, the soil in this area will be covered by a geotextile fabric to prevent direct contact with the remaining soil.

The final cover, consisting of a layer of imported general fill (6-18 inches), will be placed over the intermediate grades, followed by 6 inches of topsoil to complete the final cover. The topsoil will be hydroseeded to initiate the vegetative growth for the final cover.

A stormwater inlet will be installed to collect stormwater runoff from the quarry. The inlet will be connected to the existing storm sewer beneath Harrison Street by a 16-inch (15-inch inner diameter) PVC pipe. PVC pipe was selected because of the shallow slopes and shallow

pipe depths encountered with this design. The stormwater calculations are located in Appendix B and the stormwater collection features are shown on the Drawings.

Performance Standards

The primary performance standard for the soil cover is to prevent direct contact with contaminated solids. The soil cover will also allow the required grade to be achieved to minimize ponding and to promote positive runoff without causing erosion problems.

Institutional Controls

IDEM is expected to implement institutional controls that include land use restrictions for the area below the soil cover and groundwater use restrictions for the entire site. Deed restrictions in the form of an enforceable restrictive covenant will be used to specify that:

1. The quarry area is designated for use restrictions.
2. The area is contaminated with VOCs, polyaromatic hydrocarbons (PAHs), PCBs, and metals.
3. Excavation within the site boundaries must comply with Occupational Safety and Health Administration (OSHA) requirements for health and safety protection.
4. Any excavated soils will be managed in accordance with applicable laws.

Environmental Monitoring

Environmental monitoring will be performed to determine the remedy's effectiveness. The details of environmental monitoring will be established in the site O&M Manual. After the quarry pond is backfilled, environmental monitoring will include evaluation of cover integrity. Site inspection requirements will be specified along with the types of corrective measures necessary when problems such as soil erosion are encountered.

A groundwater monitoring program will be developed under Contract 5—Groundwater to include evaluation of the groundwater collection system's effectiveness. The program shall include the wells to be monitored, the frequency of sampling, the analytical parameters, and the type of data evaluation to be performed.

Five-Year Site Reviews

Data collected under the monitoring program will be reviewed at 5-year intervals to determine whether human health and the environment continue to be protected and whether additional RA is warranted. Alternate remedial technologies will be considered if it is determined that remedial objectives are not being achieved.

Compliance with Applicable or Relevant and Appropriate Requirements

The CSSS ROD summarized the following federal and state ARARs in Appendix G:

- CERCLA, including the Superfund Amendments and Reauthorization Act of 1986 (SARA) and all subsequent amendments
- Resource Conservation and Recovery Act of 1976 (RCRA), including the Hazardous and Solid Waste Act Amendments of 1984 (HSWA)
- The Toxic Substances Control Act (TSCA)
- The Clean Water Act (CWA) and all subsequent amendments
- The Safe Drinking Water Act (SDWA)
- The Clean Air Act (CAA)
- The Protection of Wetlands/Floodplains Management Executive Order
- The Hazardous Materials Transportation Act (HMTA)
- Indiana Water Quality Standards (Indiana Administrative Code [IAC] Title 327)
- Indiana Solid Waste Management Board Rules (IAC Title 329)
- Indiana Air Pollution Control Regulations (IAC Title 326)

Many of these laws and regulations were discussed within *the Lagoon (OU2) Revised Design Criteria Report* (January 2002) and the *Main Plant Design Criteria Report* (July 2002). Laws and regulations with unique aspects related to the design of the quarry sediment excavation are discussed below. Table 2 presents the specific requirements, the design components that address each requirement, and a discussion regarding the necessity of an ARAR waiver.

The Comprehensive Environmental Response, Compensation, and Liability Act

CERCLA requires the selected remedy to meet the substantive requirements of all environmental rules and regulations that are ARARs unless a specific waiver of the requirement is granted. Waiver of ARARs may be requested (per National Contingency Plan [NCP] 300.430[f][1][ii][C]) based on any one of six circumstances. It is not anticipated that any ARAR waiver under CERCLA will be necessary.

The Resource Conservation and Recovery Act

The applicability or relevancy and appropriateness of RCRA is discussed by first summarizing the classification of wastes present in the quarry sediments. This discussion is then followed by a brief discussion of CAMU and Land Disposal Restrictions (LDRs).

Classification of Wastes

Sediment to be excavated and disposed of in the CAMU should be classified according to RCRA status to determine whether RCRA requirements are ARARs.

The first part of the RCRA applicability determination requires analyzing whether the contaminated sediment is a RCRA hazardous waste. The RCRA mixture rule states that mixtures of hazardous waste and solid waste are to be considered hazardous waste. However, the mixture rule cannot apply to contaminated media such as soil and sediment, because the media have not been "discarded," and are, therefore, not solid waste. To clarify how the mixture rule applies to contaminated environmental media, USEPA developed a "contained-in" policy that specifies that environmental media "containing" hazardous waste must be managed as hazardous waste. This policy applies to contaminated environmental media that exhibit a characteristic of a hazardous waste, such as toxicity and to environmental media contaminated with a listed hazardous waste, such as F-listed solvents. To determine whether a contaminated environmental medium at a CERCLA site is a listed hazardous waste, the origin of the waste that contaminated the medium must be known. If the origin of the waste is not known or documented, the medium can be assumed not to contain a listed hazardous waste. The specific origin and potential hazardous waste classification of the wastes that are the source of the quarry sediment contamination is not known. Thus, the sediment is assumed to not contain a listed waste.

To determine whether a contaminated environmental medium at a CERCLA site is a characteristic waste, the medium may be tested or professional judgment may be used to determine whether testing is necessary. Under RCRA, a waste generator is not required to test its waste, but the generator can use knowledge of the waste constituents to make a characteristic determination. Because the sediment contains potential chlorinated solvent DNAPL, several toxicity characteristic compounds may result in the sediment being a characteristic waste. In particular, perchloroethene (PCE) and TCE have toxicity characteristic leaching procedure limits of 0.7 milligrams per liter (mg/L) and 0.5 mg/L, respectively. As a result, some sediment may be a characteristic hazardous waste.

Analysis of the data collected as part of the Predesign activities indicates that the elevated concentration of lead and TCE in the sediment may leach concentrations that exceed groundwater criteria. Some form of solidification and/or stabilization of the quarry pond sediment may be necessary prior to transporting the sediment to the CAMU for disposal.

CAMUs

CAMU requirements are presented in 40 Code of Federal Regulations (CFR) 264 Subpart S. Compliance with RCRA will be achieved by establishing a CAMU for the consolidation and treatment of the contaminated sediment. The CAMU rule within RCRA (40 CFR 264 Subpart S [264.552]) and IAC 329 allows for the movement of contaminated material without

triggering the requirements for "generated" hazardous waste. In essence, it allows consolidation of contaminated sludges, soils, and sediments containing listed or characteristic waste without triggering LDR requirements. In addition, this consolidation does not constitute creation of a unit with minimum technology requirements. This concept is needed for alternatives involving consolidation followed by containment under a cover or, otherwise, the alternative would not comply with RCRA ARARs. The proposed CAMU meets the requirements for new RCRA hazardous waste landfills.

Land Disposal Restrictions

While CAMUs were developed to encourage treatment of remediation wastes, the requirement to meet LDRs is specifically excluded. However, LDRs may still need to be considered, particularly because of the ROD inclusion of the potential need for treatment of some of the soils and sediments.

The LDR treatment standards were originally developed to apply to RCRA "as generated" hazardous waste and not to environmental media such as soils and sediments contaminated with listed hazardous waste. However, USEPA recognized that remediation wastes presented different issues. As a result, USEPA published Alternative LDR treatment standards for contaminated soil (sediment is included in the definition of soil) in 40 CFR 268.49. The LDR requirement asserts that treatment must achieve the greater of 90-percent reduction in total constituent concentrations or 10 times the Universal Treatment Standard (UTS) for that constituent. The UTSs are identified in 40 CFR 268.48 (Table UTS). For example, the UTS for TCE is 6 milligrams per kilogram (mg/kg). Treatment of soil containing 500 mg/kg TCE would be required only to achieve 60 mg/kg ($10 \times$ UTS) rather than 50 mg/kg.

Toxic Substances Control Act

TSCA regulates the remediation of soils contaminated with PCBs under 40 CFR 761.61 (a), Self-Implementing Onsite Cleanup and Disposal of PCB Remediation Waste. However, this section specifically excludes remediation of sediment from the self-implementing rules. As a result, the TSCA self-implementing rules are not ARARs for the quarry sediment remediation. Contaminated sediments are addressed under 40 CFR 761.61(b) (3), Performance-based Cleanup. This section specifically requires sediments dredged or excavated from waters of the United States to be managed in accordance with a permit issued under Section 404 of the CWA or the equivalent of such a permit. While a permit is not required for CERCLA response actions, consultations with the United States Army Corps of Engineers (USACE), the permitting agency, will be held to determine the requirements that would apply to the quarry sediment dredging and excavation.

TSCA also requires soil contaminated with PCBs at concentrations of 50 mg/kg or greater to be disposed at either a hazardous waste landfill permitted under RCRA or at a chemical waste landfill permitted under TSCA. Because the CAMU meets the requirements for hazardous waste landfills, soils contaminated at PCB concentrations greater than 50 mg/kg can be disposed in the CAMU. As a result, the chemical waste landfill requirements under 40 CFR 761.75 do not have to be met and are not ARARs.

TSCA storage requirements (40 CFR 761.65) for PCB materials containing PCB concentrations of 50 mg/kg or greater prior to disposal are considered ARARs and are discussed in Table 2.

Clean Air Act

CAA requirements are potentially applicable to RAs that result in air emissions, such as excavation activities. Mitigative measures to reduce air emissions during excavation will be adhered to as part of the construction plan.

Indiana Air Pollution Control Regulations (IAC Title 326)

Indiana air pollution control regulations were developed pursuant to the federal CAA. The regulations contain specific emission levels and requirements for monitoring emissions. They also contain requirements for specific types of operations (such as burning) and for certain types of industry, as well as provide specific emissions standards for hazardous air pollutants.

Requirements of IAC Title 326 are potentially applicable to RAs that result in air emissions, such as excavation and treatment activities. Mitigative measures to reduce air emissions during excavation will be adhered to as part of the construction plan.

Indiana Solid Waste Management Board Rules (IAC Title 329)

Indiana Solid Waste Management Board Rules specify requirements that apply to solid waste and hazardous waste facilities. These include Solid Waste Management Requirements, Hazardous Waste Management Permit Program and Related Hazardous Waste Management Requirements, and PCB Waste Management Requirements. The solid waste regulations include design and disposal regulations, as well as monitoring requirements and standards for groundwater protection applicable to solid-waste land disposal facilities. The hazardous waste regulations were developed pursuant to the RCRA requirements, and they pertain to generators and transporters of hazardous waste and owners or operators of hazardous waste facilities. PCB waste management requirements were developed based on the requirements of TSCA.

In general, most of these requirements mirror the above-cited federal requirements. The main requirements identical to the cited federal requirements are:

- RCRA Subpart S CAMUs—329 IAC 3.1-9-1
- RCRA LDRs—329 IAC 3.1-12-1
- TSCA PCB Remediation Wastes—329 IAC 4

Occupational Safety and Health Administration Requirements

A health and safety plan for construction activities will be required in accordance with the OSHA requirements listed in 20 CFR 1910 and 20 CFR 1926.

Minimizing Environmental and Public Impacts

Environmental and public health and welfare impacts will be minimized through:

- Site access control
- Air pollution control

Site Access Control

Access control to the quarry during remediation is necessary to prevent exposure of trespassers to contaminated sediment and soil during excavation. Access will be controlled by the current fencing and that to be installed surrounding work areas.

Air Pollution Control

A soil vapor extraction system or removal of the sediment from the geotubes may produce volatile emissions. Impacts on workers will be minimized through implementation of an employee health and safety plan specifying a PID. These instruments will also be used to monitor the air along the site boundaries to determine whether excessive emissions are affecting offsite areas. If VOC action levels are exceeded, appropriate action will be implemented, as described in the employee health and safety plan.

Minimal volatilization is expected during the dredging. The amount of volatile material appears to be less than expected and the use of geotubes should help to minimize emissions.

Compliance with Permitting Requirements

CERCLA response actions do not need to comply with the administrative requirements, such as permitting, of applicable or relevant and appropriate environmental laws and regulations. However, substantive requirements must be met. Permits applicable to the RA for the Markland Avenue Quarry (OU4) include, but may not be limited to:

- **Notification Requirement**— Adjoining land owners or occupants will be notified by IDEM.
- **Notice of Intent**— To be completed by IDEM.
- **Soil Erosion Control Plan**— To be submitted by the contractor to IDEM for approval. After IDEM has approved the plan, it will be submitted to the Howard County Soil and Water Conservation District.

In addition, the contractor will deliver all necessary preconstruction submittals to IDEM for approval prior to mobilization.

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Construction Schedule

A draft construction schedule follows this page.

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